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94-159 Phillips Lab (159)

- 1. Tide: Weather Modification Using Carbon Black
- 2 Type Effort: S&T
- 3. Proposed by: Phillips Laboratory (AFMC), Geophysics Directorate
- 4. Capability Sought and Uses to Which it Could be Put:
 - 4.1 Increuse Precipitation:
 - 4.1.1 Minday dirt rouds to decreuse tracinbility.
 - 4.1.2 Flood fields and small rivers.
 - 4.1.3 Decrezse troop comfort level.
- 4.1.4 Decrease tractability by snow or freezing rain when the temperature conditions are right.
 - 4.2 Decrease Precipitation:
 - 4.2.1 Dry our roads/fields for improved tractability.
 - 4.2.2 Deay frosh water to troops in some-dry regions.
 - 4.3 Increase Circus Cloud Cover:
 - 4.3.1 Deny visual satellite or high sidente reconnuissance.
 - 4.3.2 Decrease light level for night time operations.
 - 4.4 Dissipate Fog:
 - 4.4.1 Uncover targets for visual reids.
 - 4.4.2 Provide visital inspection of damage.
 - 4.4.3 Provide visual reconnaissance.
 - 4.1.4 Open airfields for landing/recovery
- 5. Technical Description: In the paper "Weather Modification by Carbon Dust Absorption of Solar Energy" Gray et al (Journal of Applied Mercorology, Vol. 15, April 1976, 355-386) showed that observational and modeling information indicated that the solar heating of carbon dust could be deployed on the theater scale (-100-300 km) to achieve precipitation enhancement, to create circus clouds, and to dissipate fog and low clouds. Previous work by this laboratory (1) demonstrated the ability to dissipate fog and low stratus over dirificults and (2) employed precipitation enhancement techniques to maddy the Ho Chi Minh trail reducing the flow of supplies from North Vietnam.
- 6. Risks and Linutations:
 - a. Creation of opdinum submicron particles: Low
 - b. Achieve and maintaining desired horizontal distribution of earbon black: Medium
 - e. Opportunities to capitalize on investment militarily: Medium/High
 - d. Political implications/health hazards: Medium/Low

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7. Project Plan - Major Milestones

- a. Numerical model studies completed 1996
- b. Engineering design of test engine mod. 1997
- c. Ground-based field trials completed 1993
- d. Airborne rest and evaluation of prototype completed 2001
- e. Engineering design for airborne carbon black delivery system completed 2003

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- f. Operational capability 2004
- 8. Project Cost by Fiscal: Year: (SMI)

6.1	1995 1.0	1996 1.0	1997 1.0	1998	1999	2000	<u> 2001</u>	2(1)2	2003	2004
6.2				1.5						
63					2.0	2.0	2.0	2.0	2.0	2.0
Total	1.0	1.0	2.5	2.5	3.5	3.5	3.5	∴.U	2.0	2.0

Rough estimate of total cost to operational capability: 523.5M. Life cycle costs have not been estimated.

9 Organization Point of Contact